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ROYAL BOTANIC GARDENS, KEW.

BULLETIN

OF

MISCELLANEOUS INFORMATION.

No. 5] [1923.

XVI.—STREPTOLOPHUS, A NEW GENUS OF GRAMINEAE.

D. K. Hughes.

In October 1921 some seeds were received at Kew from Mr. J. Gossweiler, Director of the Botanic Gardens, Angola. These were sown and by the summer of the next year a profusely branching grass, 3–6 ft. high, was reared. The extremely slender branches, rambling in all directions, gave it a delicate and pleasing appearance. It was remarkable from the first in that the leaf blades were conspicuously sagittate and inserted on slender petioles which stood out at an angle and held them well away from the leaf sheaths. These petioles were hardly noticeable on the young shoots but developed after the leaves were unrolled, becoming 1–2 ins. long or even longer on the older portions. At this stage an attempt was made to name it, but without success, though in foliage it was somewhat similar to *Setaria sagittifolia* Walp. When the flowers appeared they were found to be as remarkable as the leaves. The panicoid structure with the reduction of the branchlets into bristles suggested *Setaria*, but unlike that genus the bristles were slightly flattened and became more or less fused at the base into clusters or fascicles. By means of a cushion of parenchymatous cells which developed at the base, each cluster became reflexed and finally disarticulated from the main axis. This fusion of bristles and final disarticulation of the clusters is strongly suggestive of *Cenchrus* or the Australian genus *Plagiosetum*, but unlike *Cenchrus* the clusters or burrs are stalked, the bristles are branched above the base and the fusion is irregular. In *Plagiosetum* the bristles are finer and do not become reflexed as in *Streptolophus*, nor do the clusters, which are much simpler in structure, develop into burrs. Thus *Streptolophus* seems intermediate betweeen *Cenchrus* and *Plagiosetum* and, standing as a separate genus, provides a link between the two, at the same time keeping our former conception of each intact.

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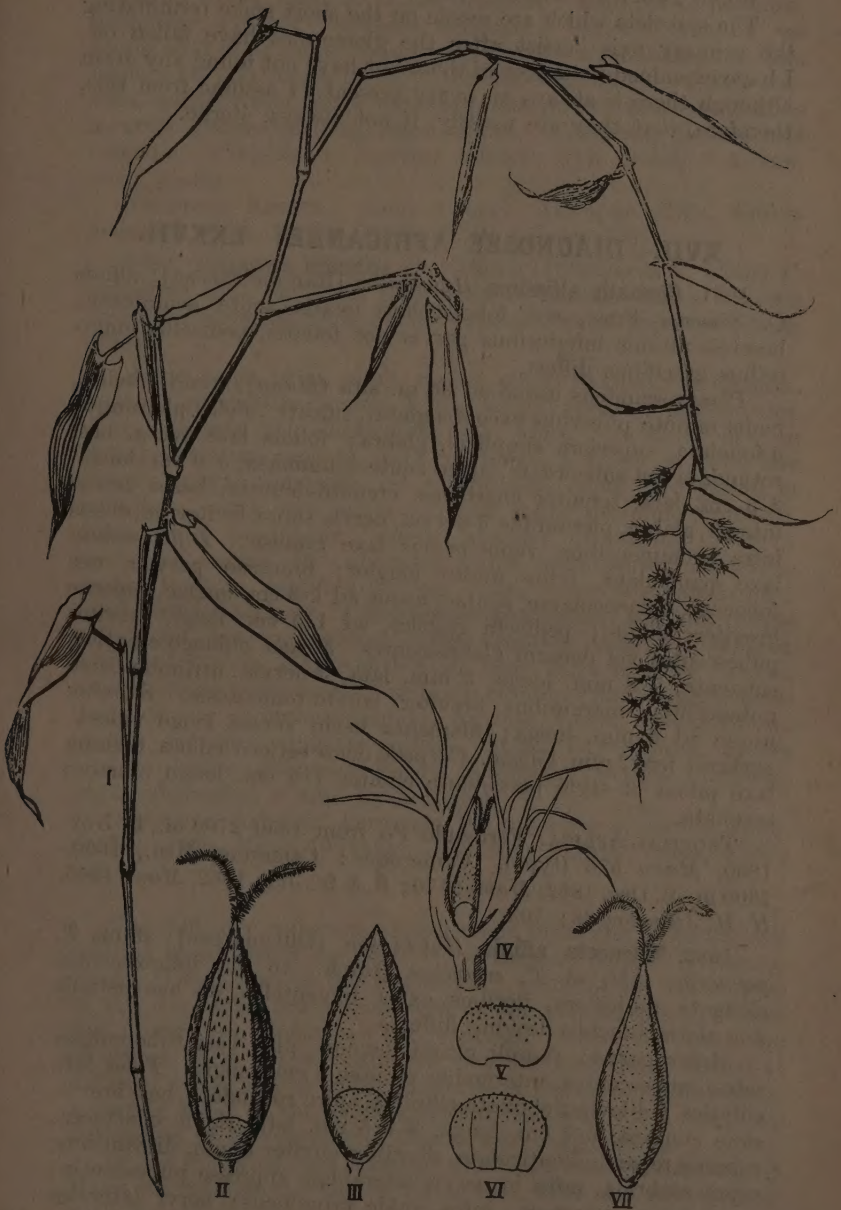
It might perhaps be observed that to a grass with weak decumbent stems the attachment of the leaf blades by a very narrow base to their slender petioles is probably of great advantage with regard to leaf movement. There are, moreover, at the bases of the leaf blades and of the petioles cushions of parenchyma which are possibly capable of heliotropic or, like those of the culm nodes, geotropic movement. It would be interesting to see the results of experiments made in this direction.

Streptolophus *Hughes* [Gramineae-Cenchrastrae] gen. nov.; affinis *Cenchro* Linn., sed glomerulis distincte pedunculatis, involucro imperfecto setis ramosis constituto differt.

Spiculae sessiles vel subsessiles in glomerulos laxe paniculatos tandem reflexos demum deciduos setis ramosis imperfecte involucratos dispositae. *Glumae* subaequales, paucinerves, membranaceo-hyalinae, spicula multo breviores. *Anthoecium* inferum ad valvam herbaceo-membranaceam spiculam aequantem reductum. *Anthoecium* superum ♂ : valva membranacea paulo indurata; valvula valvam aequans. *Lodiculae* 2, minutissimae. *Stamina* 3. *Ovarium* glabrum; styli longi, terminales; stigmata plumosa, brevia, ex apice spiculae exserta. *Gramen* annuum, vagans; *foliorum* laminae sagittatae, petiolatae, vernatione convolutae; *ligulae* elongatae, membranaceae. *Panicula* angusta, composita, ramis primariis glomeruliformibus, infimis uti axis primarius in spicam brevem apice seta terminatam elongatis; glomeruli compositi, secundarii spiculas 2–1 setis (ramulis commutatis) basin versus confluentibus quasi involucro suffultas et supra eas setarum sterilium comam gerentes.

Species unica, Angolensis.

S. sagittifolius *Hughes*. *Gramen* profuse vagans ad 2 m. altum. *Culmi* decumbentes vel geniculato-ascendentes, iterum ramosi, multinodes, nodis exsertis sparse pubescentibus. *Folia* ubique leviter retrorsum scabrida; vaginae solutae ad margines osque longe ciliatae, nervis prominentibus striatae; ligulae usque ad 2 mm. longae; petioli usque ad 5 cm. longi, apice dense pubescentes; laminae e basi sagittata lanceolatae, apice longe attenuatae, 9–10 cm. longae, 1·5–2 cm. latae, subtus sparse pubescentes. *Inflorescentia* exserta, circiter 12 cm. longa, 2–3 cm. lata, ramis (glomerulorum pedunculis) usque ad 3 cm. longis. *Glomeruli* 0·5–1·5 cm. longi anthesi virides, mature fusci vel purpureo-fusci; setae involucri demum induratae reflexae, comae erectae vel oblique patentes. *Spiculae* ovato-lanceolatae, 3·5 mm. longae. *Glumae* rotundatae, hyalinae, apice papillosae; inferior enervis, 0·6 mm. longa; superior sub 3-nervis, 1 mm. longa. *Valva* inferior 5-nervis, viridis, scaberula. *Valva* superior ovato-lanceolata, subpruinosa. *Antherae* 2 mm. longae. *Stigmata* exserta, 1·5 mm. longa. *Caryopsis* late oblonga, 2 mm. longa, a dorso leviter compressa.



Streptolophus sagittifolius. I, flowering shoot, × ½; II, spikelet showing lower glume and lower valve, × 10; III, spikelet showing upper glume and upper valve, × 10; IV, portion of a glomerule showing spikelet supported by branched bristles, × 4; V, lower glume, × 10; VI, upper glume, × 10; VII, upper floret, × 10.

West Tropical Africa. Angola, *Gossweiler*.

The spikelets which are sessile on the short spike terminating the primary axis persist after the glomerules have fallen off. I have examined a number of these but have not found any grain although there is always an ovary present. I assume from this, therefore, that they are usually, if not always, sterile.

XVII.—DIAGNOSES AFRICANAE: LXXVII.

1681. **Clematis altissima** *Hutchinson* [Ranunculaceae]; affinis *C. Simensi* Fres., sed foliolis late ovatis acute acuminatis, bracteis ultimis inferioribus parvis nec foliatis, pedicellis longioribus gracilibus differt.

Planta scandens usque ad 36 m. alta (*Mann*); rami graciles, nodis minute puberulis exceptis glabri, sulcati. *Folia* plerumque 5-foliolata, superiora simplicia, glabra; foliola late ovata, basi rotundata vel subcordata, apice acute acuminata, 5–8 cm. longa, 3–5 cm. lata, tenuiter chartacea, crenato-dentata, basin versus integra, glabra, plerumque 5-nervia, nervis supra leviter impressis infra prominentibus, venis paucis laxe ramosis. *Inflorescentia* laxe paniculata, foliis multo longior; bracteae parvae, nec foliaceae, oblanceolatae, acutae, usque ad 1·3 cm. longae, superne breviter ciliatae; pedicelli graciles, ad 1·5 cm. longi, breviter pubescentes vel demum glabrescentes. *Sepala* oblongo-elliptica, subacuta, 7–8 mm. longa, 3 mm. lata, 3-nervia, utrinque parce pubescentia, marginibus breviter lanato-tomentosis. *Stamina* usque ad 6 mm. longa; filamenta basin versus longe villosa; antherae fere 2 mm. longae. *Carpella* dense sericeo-villosa, demum laxe pilosa et stylo persistente circiter 1·5 cm. longo plumoso coronata.

Tropical Africa. Fernando Po, from 1350–2700 m., fl. Nov. 1860, *Mann* 576 (type). Cameroons: Cameroon Mtn., 1660–2300 m., fl. Dec. 1862, *Mann* 2170; fl. & fr., Jan. 1862, *Mann* 1245. *H. H. Johnston* 28; 103.

1682. **Tetracera affinis** *Hutchinson* [Dilleniaceae]; affinis *T. potatoriae* Afz. et *T. erianthae* Hutch., ab illa inflorescentia elongata multiflora, floribus extra tomentellis, ab hac petiolis non alatis, bracteis deciduis differt.

Arbor parva; ramuli ultimi flexuosi, pilis basi tuberculatis setoso-pubescentes, internodiis circiter 3 cm. longis. *Folia* late elliptica vel leviter obovato-elliptica, apice rotundata, basi brevissime cuneata, 6–7 cm. longa, 3–4·5 cm. lata, rigide chartacea, superne repando-denticulata, dentibus circiter 5 mm. distantibus, supra scabrida, infra in nervis lateralibus appresse pubescentia; costa supra impressa, infra valde prominens; nervi laterales utrinsecus circiter 10, a costa sub angulo 50° abeuntes, infra prominentes; petioli 1–1·5 cm. longi, basin versus incrassati, supra canaliculati, appresse setuloso-pubescentes. *Inflorescentia*

multiflora, laxe paniculata, basin versus parce foliata, tomentella, usque ad 25 cm. longa et 12 cm. diametro; rami erecto-patentes, dichotome ramosi; bracteae deciduae; pedicelli subnulli vel usque ad 2 mm. longi. *Sepala* plus minusve rotundata, coriacea, usque ad 6 mm. longa, utrinque setuloso-tomentella. *Petala* obovata, circiter 8 mm. longa, extra appresse pubescentia, marginibus incurvis glabrescentibus, intra villosa. *Filamenta* glabra, basi connata. *Carpella* 3, breviter villosa; styli crassi, 5–6 mm. longi, glabri.

Tropical Africa. Gold Coast: Akwapim Hills, flowers yellowish white, 20 Oct. 1900, *W. H. Johnson* 796.

1683. **Tetracera eriantha** *Hutchinson* [Dilleniaceae]; affinis *T. potatoriae* Afz., sed foliis basi cuneatis, petiolis alatis, bracteis magnis subpersistentibus, sepalis et petalis extra appresse villosis differt.

Arbor usque 10 m. alta; ramuli ultimi flexuosi vel tortuosi, teretes, internodiis circiter 2 cm. longis, appresse pubescentes. *Folia* obovata vel elliptico-obovata, apice rotundata, basi in petiolum alatum cuneata, 5–12 cm. longa, 2·5–5·5 cm. lata, fere integra, rigide chartacea vel subcoriacea, supra fere glabra et subnitida, infra laxe pilosa; costa supra profunde impressa, infra valde prominens; nervi laterales utrinsecus 12–18, a costa sub angulo 45° abeuntes, infra prominentes, marginem versus furcati; petioli 0·5–2 cm. longi, supra late canaliculati, alati, minute strigosi. *Inflorescentia* paniculata, laxiflora, usque ad 15 cm. longa; bracteae subpersistentes, magnae, oblongae, usque ad 1·8 cm. longae et 0·8 cm. latae, infra appresse villosae, supra minute pubescentes; pedicelli circiter 5 mm. longi, tomentosi. *Sepala* obovato-rotundata, coriacea, 5 mm. longa, villosa. *Petala* exteriora appresse villosa, intima fere glabra, circiter 0·8 cm. longa. *Filamenta* glabra, filiformia. *Carpella* 3, villosa; styli subgraciles, 5 mm. longi, glabri.

Tropical Africa. Fernando Po, calyx green, corolla white, fl. Dec. 1859, *Mann* 79 (type). Southern Nigeria; Oban, *Talbot* 1320.

The difficulty collectors experience in obtaining flowering and fruiting specimens of the trees of the Tropical African Evergreen Forest is well seen in the fragmentary material by which most of the *Anonaceae* are known even at the present time. Where the flowers are unisexual and especially when the trees are dioecious, it is not advisable to consider material collected at different times and in different places as representing the corresponding sexes of the same species particularly when there are differences in the vegetative organs and indumentum.

In the following case material with male flowers collected by Mann in 1861 on the Gabon River (No. 960) and the material with female flowers collected by him on Mount John, Kongui River, Cameroons (No. 1782) was treated by Oliver in the Flora of Tropical Africa Vol. I. p. 23 as being opposite sexes of the

same species. There seems no justification for this especially as there are several points in which these two collections differ. Until material is discovered that shows without doubt that they are the same these collections should be kept separate.

1684. **Popowia cauliflora** *Chipp* [Anonaceae]; affinis *P. diclinae* Sprague, sed petiolis tenuibus cymis numerosissimis confertis pubescentibus ex ramulis adultis ortis differt; a ceteris speciebus africanis tropicis occidentalibus foliis petiolatis adultis subtus pilosis vel pubescentibus nervis lateralibus utrinsecus 12–18 differt.

Ramuli novelli dense ferruginosi pubescentes. *Folia* breviter petiolata membranacea, supra glabra praeter costam nervosque, subtus pubescentia, oblanceolata vel oblonga, basi attenuata rotundata, apice obtusata acuminata, 15 cm. longa, 5–6 cm. lata, nervis lateralibus utrinsecus circiter 14. *Cymae* numerosissimae ex ramulis adultis ortae; flores numerosi, dense pubescentes, 5 mm. diam.; pedicelli dense pilosi, 2·5 cm. longi. *Sepala* minuta, extra pubescentia, intus glabrata, lanceolata, acuta, 1 mm. longa. *Petala* exteriora pubescentia, 4 mm. longa; interiora cuneata, minutissime pubescentia, 1 mm. longa. *Carpella* numerosa; ovaria pilosa; stigmata sessilia, glabra. *Monocarpella* stipitata, pubescentia, inter semina valde constricta. ♂ flores ignoti. *Clathrospermum Mannii* Oliv. ex parte (quoad spec. ♀) Fl. Trop. Afr. 1. p. 25; *Popowia Mannii* Engl. et Diels ex parte, Monogr. Anonac. p. 49, non Baill.; *Popowia diclina* Sprague, ex parte, Kew Bull. 1908, p. 53.

Tropical Africa. Nigeria: Old Calabar, *Thomson*. Cameroons: Kongui River, Mt. John, *Mann* 1782.

1685. **Popowia diclina** *Sprague* emend. *Chipp* [Anonaceae]; affinis *P. cauliflorae* Chipp, sed petiolis crassis cymosis paucis dense pilosis ex ramulis novellis ortis differt; a ceteris speciebus africanis tropicis occidentalis foliis petiolatis adultis subtus pilosis vel pubescentibus nervis lateralibus utrinsecus 12–18 differt.

Ramuli novelli dense tomentelli. *Folia* breviter petiolata, membranacea, supra glabra praeter costam nervosque, subtus dense pilosa, oblanceolata, basi attenuata, rotundata, apice obtusa acuminata, 22 cm. longa, 8 cm. lata, nervis lateralibus utrinsecus circiter 14. *Cymae* paucae, dense pilosae, ex ramulis novellis ortae; flores pilosi, 3 mm. diam.; pedicelli 7 mm. longi. *Sepala* minuta extra dense pilosa, intus glabrata, oblonga, apice acuta, 1 mm. longa, 0·7 mm. lata. *Petala* exteriora extra dense pilosa, intus pubescentia, basi concava, supra crassa, acuta, 2 mm. longa, 3 mm. lata; interiora cuneata, pubescentia, 1 mm. longa. *Staminodia* minuta, numerosa. *Stamina* 1 mm. longa; thecae oblongae; connectiva pubescentia. ♀ flores ignoti. *Clathrospermum Mannii* Oliv., ex parte (quoad spec. ♂) Fl. Trop. Afr. i. p. 25; *Popowia Mannii* Engl. et Diels ex parte, Monogr. Anonac. p. 45, non Baill.; *Popowia diclina* Sprague, ex parte, Kew Bull. 1908, p. 53.

Tropical Africa. Gabon: Gabon River, *Mann* 960; Libreville, *Pierre* 2922.

1686. **Xylopia villosa** *Chipp* [Anonaceae]; *X. Ellioti* Engl. et Diels, affinis, sed ramulis novellis densissime ferruginoso-pilosis floribus plerumque dense fasciculatis petalis interioribus linea transversa pilorum longorum alborum intus ad basim instructis differt.

Arbor excelsa, ramulis novellis densissime ferruginoso-pilosis, adultis glabris. *Folia* petiolis dense ferruginoso-pilosis, subcoriacea, supra glabrescentia, subtus adpresso-pilosa, oblonga vel lanceolata, basi rotundata, apice acuta vel acuminata, 8–12 cm. longa, 3–5 cm. lata, nervis lateralibus utrinsecus 6–8. *Flores* dense fasciculati haud solitarii; pedicelli densissime ferruginoso-villosi; bracteolae tomentosae, late ovatae. *Calyx* extra tomentosus, intus glaber; lobi late triangulati, 2 mm. longi, 3 mm. lati. *Petala* exteriora basi dilatata, supra linearia, extra dense sericea, intra ad basim glabra, 3 mm. longa, medio 3 mm. lata; interiora paullo minora, albo-sericea, intus ad basim glabra sed linea transversa pilorum longorum alborum instructa. *Stamina* linearia, 2 mm. longa, connectivo dilatato producta. *Carpella* pilosa. *Fructus* ignoti.

Tropical Africa. Nigeria: Ibadan Forest Reserve, flowering November, *Punch* 119; flowering October, *Foster* 354.

1687. **Smithia parvifolia** *Burtt Davy* [Papilionaceae-Hedysareae]; species *S. recurvifoliae* Taub., affinis, sed stipulis minoribus latioribus obscurioribus, foliolis eciliatis et nervis non prominentibus differt.

Frutex 1–1·5 m. altus. *Ramuli* annotini teretes, nigrescentes, hispiduli, 2 mm. crassi, hornotini breves, tenues, circiter 1 mm. crassi, glanduloso-hispiduli, stipulis persistentibus squarrosis ornati. *Folia* 5-juga, circiter 1 cm. longa, recurva; rhachis hispidus; foliola dense imbricata, oblique ovalia, obtusa, mucronata, 3–4 mm. longa, costa infra parce setosa excepta glabra; costa valde excentrica, lata, pulla; nervi laterales inconspicui; stipulae persistentes, ovatae, acutae, circiter 2 mm. longae, ciliatae, atrobrunneae, marginibus pallidioribus. *Inflorescentia* ad ramulos laterales breves terminalis. *Flores* 1–3, circiter 1·5 cm. longae. *Calyx* profunde 2-partitus; lobi circiter 9 mm. longi, pubescentes vel hispidi. *Corolla* glabra, striata, caerulea. *Legumen* non visum.

South Africa. Transvaal: Barberton Dist.; river banks at Bosch's, near Barberton, 1300 m., fl. Sep., 1889, *Galpin* 532!

1688. **Kalanchoë connata** *Sprague* [Crassulaceae]; affinis *K. brachylobae* Welw., foliis basi connatis conspicue bicrenatis necnon collo (parte superiore) corollae tubi longiore distincta.

Planta erecta, circiter 1 m. alta., undique glabra. *Caulis* teres, laevis, basi 2 cm. diametro, apice (sub inflorescentia) 4 mm. diametro; internodia basalia 0·7–1·5 cm. longa, superiora 11–12 cm. longa. *Folia* ovato-oblonga, rarius ovata, dimidio

superiore arcuatim recurva, apice obtusissima, in basin late cuneatim angustata, 9–11 cm. longa, 4·5–5 cm. lata (folia ovata 7 cm. longa, 4·5 cm. lata), supra partem basalem cuneatam integram conspicue bicrenata, crenis primariis crenula singula inferne instructa; nervus medius supra propter plicationem laminae valde impressus; folia superiora oblongo-lanceolata vel anguste lanceolata, 7–9 cm. longa, 2–3·5 cm. lata, potius dentata quam crenata. *Thyrsus* bracteatus, in toto 3 dm. longus; bracteae inferiores lineares, obtusae, 5 cm. longae, 7 mm. latae, integrae, superiores subulatae, gradatim minores, ultimae circiter 3 mm. longae; pedunculi dichasiorum 4–14 cm. longi; dichasia bis furcata, deinde in monochasia transientia, 20–25-flora; pedicelli 7 mm. longi. *Sepala* lineari-lanceolata, acute acuminata, recurvo-ascendentia, 1 cm. longa, 1·6 mm. lata. *Corollae tubus* viridi-luteus, ampullaeformis, vix 1·5 cm. longus, infra medium rite quadrangularis; lobi supra flavo-lateritii, recurvi, obovato-lanceolati, in toto 9 mm. longi, 4–4·5 mm. lati, apice uncati, unco ultra 1 mm. longo. *Stamina* omnia antherifera, inferiora 8 mm. supra basin, superiora 10 mm. supra basin inserta; filamenta inferiora 2 mm. longa, superiora vix ultra 1 mm. longa. *Squamulae* flavae, linearisubulatae, 4·5 mm. longae. *Pistilla* 1 cm. longa; styli circiter 2·5 mm. longi; stigmata extrorsum spectantia.

Tropical Africa. Angola. Described from a living plant received from Mr. M. T. Dawe in 1921, which flowered at Kew in January 1923. The inflorescence greatly resembles that of *K. brachyloba* Welw., but the narrow upper part of the corolla-tube is considerably longer and the foliage is very different.

1689. **Homalium (Eublackwellia) subsuperum,** *Sprague* [Samydaceae-Homalieae]; affine *H. dentato* (Harv.) Warb., a quo pedicellis brevioribus, ovario maxima pro parte supero recedit.

Ramuli subangulati, vix 2 mm. diametro, fusco-brunnei, dense lenticellati; internodia 0·7–1·5 (–2) cm. longa. *Folia* elliptica, apice breviter acute cuspidata, basi obtusa vel breviter subcuneata, 4·5–6·5 cm. longa, 3–4 cm. lata, grosse crenato-serrata, tenuiter coriacea, glabra, utrinsecus 5–6-nervia, nervis sub angulo 45° vel minore excurrentibus supra satis obviis subtus prominentibus, rete venularum utrinque praecipue subtus manifesto; crenae 4–8 mm. longae; petioli 1·5–2 mm. longi; gemmae axillares pulvinares transverse oblongae, 1·5–1·7 mm. latae, nitidulae, spadiceae. *Thyrsi* axillares, infra gemmas orti, subpyramidales, 3–5 cm. longi, inferne circiter 2·5 cm. diametro; pedicelli 0·8 mm. longi, 0·3–0·4 mm. infra apicem articulati. *Flores* hexameri, dense minute pubescentes. *Sepala* anguste triangularia obtusa, vel subacuta, 1·25 mm. longa, basi 0·6–0·7 mm. lata. *Petala* oblonga, apice rotundata, 1·7 mm. longa, 0·8 mm. lata. *Staminodia* episepala, pulvinaria, dense pubescentia, 0·5–0·6 mm. lata. *Stamina* epipetala; filamenta 2·75 mm. longa, glabra. *Ovarium* trimerum, basi in torum paullulo (0·3–0·4 mm.) immersum, in toto 1·5 mm. longum, extra patule

pubescens, intus longius pilosum, in stylum 1 mm. longum sensim angustatum; styli rami 0·7–0·8 mm. longi.

South Africa. Cape Province: Transkei; Ndindini Forest, *J.E.Kaufmann in Herb. Forest Dept.* 3225 (*S. Afr. Nat. Herb.* 2571) (type). Natal: Oudeni Forest Reserve, *Farrell in Herb. Forest Dept.* 3299 (*S. Afr. Nat. Herb.* 2570).

The Natal specimen has longer pedicels (1·4 mm. long, articulate 0·8 mm. below the apex), slightly larger and more pubescent flowers, acute sepals and the ovary slightly more sunk (0·6 mm.) in the torus. It agrees so closely, however, in other respects that it seems inadvisable to separate it, even as a variety. According to Mr. Farrell, *Homalium subsuperum* is found all over the Oudeni Forest Reserve, and attains a height of about 60 ft. and a diameter of 2 ft. The native name is Ndhlebenhlovu.

1690. **Leucospermum cordatum** *Phillips* [Proteaceae-Proteeae]; affine *L. hypophyllo* R. Br. foliis cordatis differt. *Frutex* prostratus. *Rami* elongati, paullo pilosi. *Folia* horizontalia vel leviter reflexa, 3·5–4·3 cm. longa, basi 1·8–2·2 cm. lata, ovata, apice obtusa, basi cordata, pilosa et minute tomentosa, demum glabra. *Capitula* pedunculata, apice ramorum solitaria vel rare 3-nata, 3 cm. lata, pedunculo 2 cm. longo tomentoso bracteas ovatas pilosas ciliatas gerente. *Receptaculum* 7 mm. longum, 5 mm. latum, conicum. *Bracteae* flores subtendentes 1 cm. longae, obovatae, aristatae, basi angustatae, dense villosae, ciliatae. *Calycis tubus* 5 mm. longus; lobi 9 mm. longi, lineares, pilosi, apice dilatato 3 mm. longo elliptico piloso. *Antherae* 2 mm. longae, lineares. *Ovarium* 2·5 mm. longum, glabrum; stylus 1·7 cm. longus, glaber; stigma 1·7 mm. longum, conicum.

South Africa. Caledon Div.: Hottentots Holland Mountains, 800 m., among loose stones and grass, October 1922, *T. P. Stokoe* (*National Herbarium, Pretoria*, No. 2607).

XVIII.—MISCELLANEOUS NOTES.

Coffee and Para Rubber in Uganda.—In the *Bulletin* for 1921 (p. 346) a note was published on a "Report on a visit to Guatemala and Costa Rica to investigate the methods of Cultivation of Coffee," by Mr. Le Poer Trench, Kenya Colony. Supplementary to this it may be of interest to refer to "A Report on Coffee Cultivation in Uganda with Comparative Notes on Costa Rica," by Mr. C. H. Lankester (of Las Concavas Estate, Costa Rica),[1] and in conjunction with these "A Report on Para Rubber in Uganda," by Mr. Herbert Ashplant,[2] may be conveniently considered, as the cultivation of these two plants appears to have been carried on together, more or less successfully, in Uganda.

[1] Circular No. 7, Dept. of Agric., Kampala, Uganda.
[2] „ No. 6, „ „ „ „ , Nov. 1921.

It is reported that three main types of Coffee are grown in the Protectorate. These are, in relative order, two varieties of *Coffea arabica*, known respectively as " Nyasa " and " Bourbon," and *Coffea robusta*, which is apparently indigenous to Uganda in the regions bordering on the Congo. The " Nyasa " variety is indistinguishable from that grown in Costa Rica. Of the *arabica* varieties, " Nyasa " seems to prosper best in the lower and warmer regions and " Bourbon " in the higher and cooler areas. *Robusta*, again, thrives in almost any situation where coffee is grown, but it is especially suited to lower elevations, and would prove an economic crop when the others would fail (Lankester, p. 5). The selection is left to individual preference, but of the two varieties of *arabica* " where shade is not advisable " " Bourbon " is considered to offer the greater number of advantages, including that of being a precocious cropper. The two forms are said to have hybridised very extensively; the constant distinguishing features of the two original forms are said to lie in the colour of the young terminal leaves. In " Bourbon " they are a very pure bright green, in " Nyasa " more or less bronze or copper-coloured, the latter being the dominant type (*id.* p. 6). In connection with the desirability of cultivating one special variety Lankester states that " the London Brokers indicate a preference for Coffee of ' Bourbon ' type owing to good liquoring qualities."

In the opinion of the Coffee Expert to Messrs. Lewis & Peat (London) " Bourbon Coffee, as grown in Nyasaland, is a desirable commercial form and worth growing where others will not succeed." " The great majority of estates are interplanted with Para Rubber (*Hevea brasiliensis*) and coffee has proved of great service in bridging over the long wait till the rubber comes into production. Several estates, however, show that coffee may be a permanent crop, and yields of 5 cwt. clean coffee to the acre have been averaged. The soil is fertile, as evidenced by the fine ' Mvuli '[1] trees, but light and sandy in texture, and very subject to wash on the least slope. Sugar cane and Tobacco, it is suggested, may prove profitable alternatives. Labour shortage has been advanced as a reason for the abandonment of estates or restriction of areas. Coffee under ' Mvuli ' shade, even on abandoned estates, always looks well and carries an apparently productive amount of cherry " (*id.* p. 4).

The area under coffee in 1920 was 25,437 acres, and it is explained that " the area of some 7,000 acres formerly in cultivation under Para can be discounted now as having been shaded out, and probably some 8,000 to 10,000 acres have been abandoned, owing to currency adjustments, restrictions of credit, and, in some cases, labour difficulties, leaving approximately 15,000 acres at present in cultivation. The amount of native production is negligible " (*id.* p. 3). The total acreage of Para Rubber under European management in Uganda (1921) was approximately 17,000 acres, about 9,500 being under 5 years old and 7,500 over

[1] *Chlorophora excelsa.*

5 years old, and there were about 900 acres of native grown Para, mostly in the Buganda Province. Some 12,000 acres out of the 17,000 acres of European-owned Para were interplanted with *Coffea arabica*. Unlike the rubber in the Middle East, there is no considerable acreage concentrated in any one spot. " Even in the case of the plantations controlled by the few limited companies, the largest compact block barely exceeds 500 acres. By far the greater portion of the rubber is distributed as 50 to 250 acre estates, situated for the most part in the Kiagwe district " (Ashplant, p. 3). The low temperatures of high altitudes have been found to have a very retarding effect upon the growth of *Hevea*. The yields also become progressively poorer as greater elevations are reached. Uganda is said to compare unfavourably in these respects with other rubber countries in the East, which excepting a few thousand acres in Java, Ceylon and South India are within a few hundred feet of sea-level. The Buganda Province in which most of the rubber is grown has an annual rainfall of only about 50 inches; but the regular distribution of the rainfall throughout the year and the high moisture retaining capacity of the soils are calculated to do much to make up the deficiency (Ashplant, p. 4).

In spacing, when the needs of the two crops have to be allowed for, the avenue system, say 15 ft. by 30 ft., offers special advantages, but the susceptibility of the local trees to wind damage would make such wide gaps inadvisable on Uganda estates, where the damage done by wind is serious, and, " all things considered, perhaps the best spacing is a modification of the 24 ft. by 24 ft. system, whereby an extra tree is planted in the middle of each square. This system, which has been carried out on one or two of the younger estates, permits of the planting of three rows of coffee between the lines of rubber and gives approximately 130 Hevea trees to the acre " (*id.* p. 19). Nearly all the Para rubber in Uganda has been interplanted with Arabian Coffee, and so far as one can judge from the appearance of the trees everywhere they have not suffered in any way from the competition of the Coffee bushes. The rubber tree shade is beneficial up to about the sixth year, when it becomes increasingly prejudicial, and after the seventh or eighth year it is doubtful whether the small crop of coffee borne is worth the picking. " The fact that coffee can be productive for so long a period under *Hevea* is undoubtedly some compensation for the long wait before the rubber becomes revenue-producing in Uganda. Coffee interplanted with rubber in Malaya has to be taken out in the fourth year. The ability to grow two important crops like coffee and rubber intermingled has, however, not been an unmixed blessing; divided attention has frequently led to one or the other being neglected " (*id.* p. 17).

Cultivation, Harvesting, Preparing, Machinery and Diseases are also discussed by the respective authors. Lankester concludes with the statement that it is inadvisable to brand coffee as " Costa

Rica" even if grown from seed derived from that country, as well prepared Uganda Coffee is sufficient to stand on its own merits. In view of the rubber crisis, Ashplant's concluding remarks are of interest. He discusses the prospects of existing estates, advising the retention of those well established of 50 acres and upwards; but in the case of smaller estates, which would not justify the erection of proper equipment, as an alternative to increasing the acreage to a profitable standard he advises that "if the rubber is still young and occupying good coffee land, there should, if an extension of the latter crop is feasible, be no question about displacing the rubber in favour of coffee."

J. H. H.

A New Book on Pears.*—This work is the sixth of its series, former volumes by the same author having dealt with grapes, apples, plums, peaches and cherries. They are published by the New York Agricultural Experiment Station and if, as is hoped, they are followed by similar treatises on small fruits, the whole should eventually form an encyclopedia of the greatest value on fruit cultivation in temperate regions. In noticing previous volumes we have testified to the remarkable care and comprehensiveness Dr. Hedrick and his assistants have shown in their preparation. To say that this volume falls in no way short of its predecessors is to give it high praise. Its aim is to provide a complete record of the development of the pear from the earliest to the present time; to describe more or less fully the cultivated varieties; and to give their synonymy, bibliography and economic value. The work is intended primarily for cultivators and students in the United States and particularly in New York. Nearly eighty of the varieties most important in those areas have been selected for especial and more detailed description, and each of these varieties is illustrated by an excellent coloured plate. The numerous minor varieties are more briefly and summarily described.

The pear as generally known in gardens is derived exclusively from *Pyrus communis* Linn., a tree whose native habitat is South Europe and Western Asia. In France and Central Europe *Pyrus nivalis* Jacquin, is sometimes cultivated, the fruits being used for perry-making and, when bletted, for dessert. It is known as "snow pear." A third species, *P. serotina* Rehder, native of China and commonly called "Sand pear," is of some importance in North America, where, in the South and Middle West States, hybrids between it and the common pear are found to be better adapted to the climate than the pure derivatives from *P. communis*, but their fruits are decidedly inferior to the best types of common pear. These three species may be said

* The Pears of New York. By U. P. Hedrick. 1 vol. 4to (xii + 636 pp.), with eighty coloured plates and one portrait.

to comprise all the forms of *Pyrus* whose fruits are of any real value to mankind.

Dr. Hedrick gives a very interesting history of the pear from the times of the Ancient Greeks to the present day. He considers that the tree was commonly cultivated in Greece one thousand years before Christ. In referring to Theophrastus, who lived 600 to 700 years later, the author makes a rather sardonic reflection on modern horticultural scribes: "Out of one of the books of Theophrastus, *Enquiry upon Plants*, a very good treatise on the pear might be compiled and one better worth following than many of his more modern imitators." In tracing the history of this fruit in Italy, France, Belgium, England and other parts of Europe, Dr. Hedrick gives the palm to the Belgians who, by their cultural skill and careful breeding and selection, aided by a suitable climate and soil, have helped more than any other nation to bring it to its present perfection. "The pear was improved more in Belgium in one century than in all the centuries that had passed."

The climate in many parts of the United States is not congenial to the pear and trees seem to be much more subject to disease and insect pests than they are in Europe. We are informed that the Pacific States now form the main centre of pear cultivation in North America.

Although, as already intimated, this book is intended primarily for cultivators in the United States, it is of scarcely less value to fruit-growers in Europe. It should find a place in the libraries of all who are interested either commercially or scientifically in the pear.—W. J. B.

The Lloyd Herbarium.—Recently an interesting collection of British Plants made by George Lloyd, M.D., has been presented to the Royal Botanic Gardens by Mrs. Lloyd through the Bournemouth Natural History Society.

Dr. Lloyd was born at Albrighton, Shropshire, in 1804 and graduated at Edinburgh in 1826. He did not practise medicine, but devoted his time to Botany. He knew Sir William Hooker well when the latter was at Glasgow, and in company with Sir Joseph Hooker and the botanist Arnott made careful collections of plants in England, Scotland, Ireland and Wales.

Most of the plants were collected between 1825 and 1843, but a few of later date were received from the Botanical Society of London and are incorporated in the collection.

The Herbarium which numbers some 1250 sheets is for the most part in an excellent state of preservation, and is mounted on sheets with a border of cardboard. It does not contain many "critical" species, but the following may be worthy of note, being either varieties or species which are now extinct in the British Isles :—

Arthrolobium ebracteatum DC. Coll. et Com. J. C. Lukis, Guernsey.

Ononis reclinata L. Galloway: "presented by Dr. Hooker, January, 1836."
Sibbaldia procumbens L. Ben Nevis: May 1825.
Eryngium campestre L. Durham: coll. Dr. Hooker; "presented 1832."
Gentiana nivalis L. Clova: "Dr. Hooker; presented 1832" (a very large specimen).
Myosotis alpestris Schm. Ben Lawers.
Phyteuma spicatum L. Mayfield; Sussex: "Mr. Borrer."
Salvia Marquandii Druce, under the name "*Salvia pratensis* var. *praecox* or *clandestina*": Vazon Bay, Guernsey. "W. C. Trevelyan August 1835." One of the earliest specimens of this species in existence. From the only locality known in the world where it is found over an area of a few square yards.
Eriophorum alpinum L. "Scottish Highlands, W. C. Trevelyan." This species has been for many years extinct in the only known British locality—the Moss of Restenet, Forfarshire.—C. V. B. M.

Xanthium spinosum in Neolithic deposits in Bulgaria.—*Xanthium spinosum* is one of the commonest ruderal plants of Central Europe and the Mediterranean region. It has generally been considered by recent writers to be a native of South America. The strong arguments in favour of this view will be found summarized by Thellung in his Flore adventice de Montpellier, pp. 505–506, and many references to earlier literature on the subject will be found there.

Millspaugh and Sherff in their Revision of the North American Species of *Xanthium*, Field Museum of Natural History, Botanical Series, Vol. iv., No. 2, p. 14, April 1919, give the distribution as follows:—"Now generally distributed almost throughout the United States; found also in South America, where probably native, Central Europe, 'western Asia, southern Africa and in Australia'." It should also be pointed out that the centre of distribution of the genus is certainly to be found in the New World.

Another opinion, which was current among earlier botanists, that *Xanthium spinosum* was native in South Russia, was rejected by Ascherson (Verhandl. bot. Ver. Brandenb. xvii., 1875, Sitzb., p. 12, and l.c. xxii., 1880, Sitzb., p. 89). It may also be noted that according to L. Simonkai and Karl Flatt (Bot. Centrlb. Bd. lv., 1893, p. 365) both A. Florentin and also C. Spegazzini have collected fossil fruits ("false-fruits") of *X. spinosum* from the Pliocene beds in the Tertiary formation of the Pampas.

During a visit to Bulgaria last summer Dr. N. Stoianoff of Sofia University gave me some semi-fossilized fruits which careful comparison at Kew has shown to be those of *Xanthium spinosum*. These were obtained during excavations in prehistoric deposits near the village of Bogorow, 15 km. east of Sofia.

The "fruits" had been collected in considerable quantity and stored as if for use as food or fodder. The deposits are of Neolithic age and an account of them has been published in the Annuaire du Musée National de Sofia, 1921, pp. 217–222, Sofia 1922.

Whatever may be the real history of *Xanthium spinosum* in the Old World this discovery would seem to indicate that the species existed in South Europe long before the dates (1700–1750) accepted by Thellung for its first introduction and establishment.—W. B. T.

Plant Names.*—The admirable little book compiled by Dr. Lindsay for the gardener and lover of flowers who know "small Latin and less Greek" provides in a compact form explanations of the scientific names of flowers whose meanings must ordinarily be sought in bulky lexicons, and much information on the principles and history of plant naming with which the general public are little acquainted. It is for the horticulturist and amateur gardener what Dr. Daydon Jackson's "Glossary of Botanic Terms" is for the botanist, and, since Alcock's "Botanical Names for English Readers" (1876) is now out of print, it is a welcome addition to the gardener's library. The delightful manner in which the information is imparted will make it the more appreciated by the section of the public for whom the work is intended. The author must be congratulated on producing a book which every amateur gardener, horticulturist, and teacher of nature study will find of much interest and utility.

Quebracho Colorado.—*Quebrachia Lorentzii* Griseb. (*Anacardiaceae*), is an important forest tree abundant in the northern parts of the Argentine Republic and found also in Paraguay. It is described as of peculiar appearance, with small leaves and a trunk with a rough bark often covered with moss-like lichens of which cattle are stated to be very fond. The timber is extremely hard, close-grained and durable, light in colour when first cut becoming dark red on exposure to the light and air. The name Quebracho signifies axe-breaking as the wood is difficult to work and will soon turn the edge of the finest tempered tools. Formerly the chief application of the wood was for railway sleepers in South America, but during recent years it has become of first importance as a tanning material for

* Plant Names. By T. S. Lindsay, B.D., London. The Sheldon Press, S.P.C.K. House, Northumberland Avenue, W.C. 1923. pp. 93. 2*s.* 6*d.*

which purpose the tree was felled, denuded of its sapwood and the logs finally shipped to the United States of America and to Germany. At the present day the extract is prepared on the spot by a simple process, the logs being put through a machine which reduces them to chips which are then boiled in water until all soluble matter is extracted from them. The solution thus obtained is concentrated down to the consistency of pitch, and in this form, after being dried, it is exported to all parts of the world for the use of tanners.

From a recent report issued by the United States Department of Commerce it appears that there is a danger of the extinction of the Quebracho forests owing to the wasteful methods of exploitation. The Report states that "the total available tonnage of Quebracho standing in 1922 has been liberally estimated at 71,300,000 metric tons for Argentina and 3,500,000 metric tons for Paraguay. A minimum estimate of the potential production of Quebracho extract by the companies now operating in Argentina and Paraguay is about 240,000 metric tons per annum, and as 1 ton of Quebracho extract represents about $4\frac{3}{4}$ tons of logs it would require an annual felling of 1,400,000 metric tons of Quebracho wood for tanning purposes alone in these two countries. Add to this the annual felling for construction work, paving blocks, fuel, telegraph and telephone poles, for which this wood is extensively used, also an annual requirement of 3,600,000 railway sleepers, 1,600,000 fence posts, and an annual exportation of Quebracho logs varying from 108,945 metric tons in 1917 to 56,582 in 1920 (decrease due to world-wide industrial and commercial depression) and the duration of the present stands of Quebracho wood can be readily grasped, together with the necessity for forest protection and the restoration of denuded tracts. This should not prove difficult, as with proper forestry methods the natural stock can be replaced in 25 to 50 years.

"With the extension of railroads through the forestal regions, the greater exploitation of Quebracho will be facilitated, and as an increasing demand for leather may be anticipated with the general revival of the industries, it is safe to assume that the required annual tonnage of Quebracho wood will be greatly enlarged, thereby reducing the existence of the present stands to 20 or possibly 25 years, unless energetic measures for the replacement of felled trees and the establishing of new forests in suitable places are adopted."

Products of the Quebracho tree will be found in Case 30, Museum I., and a railway-sleeper of the wood in Museum III. at Kew.—J. M. H.

Printed under the authority of His Majesty's Stationery Office
By Eyre and Spottiswoode, Ltd., East Harding Street, E.C. 4,
Printers to the King's most Excellent Majesty.